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THE CRISIS IN THE ALUMINUM INDUSTRY

THE aluminum industry of the Pacific Northwest is again facing a crisis. This crisis grows out of the almost complete dependence of the local industry upon hydroelectric power, very largely unsupported by auxiliary stand-by steam capacity. Periodically the aluminum producers, together with other large industrial users of electric power in the area, have been subjected to production cutbacks because of power shortages resulting from low stream flow or because of normal seasonal requirements of domestic and other consumers during the winter months. Such a situation occurred last month when rapidly diminishing stream flow in the Columbia River led the Bonneville Power Administration on September 17 to cut off 245,000 kilowatts of interruptible power from large industrial users in its marketing area. This curtailment of power supply forced the immediate closing down of aluminum pot-lines by two of the three primary aluminum producers in the Pacific Northwest and a substantial reduction in operations by the third. The five aluminum smelting plants in the area operated by these producers depend upon interruptible electric power for approximately 20 percent of their total requirements.[1]

Because of the extremely low water level and the impending seasonal peak requirements for general industrial and household use during the fall and winter months, further reductions for large industrial users, as well as for other consumers, seem almost inevitable. Such reductions would probably extend to firm as well as interruptible power, and cannot be offset to any significant extent by recourse to steam-generated power because of the very limited steam capacity existing in the Pacific Northwest and the lack of transmission facilities which would permit large drafts upon outside sources, such as California, which currently enjoys a comfortable surplus over immediate requirements.

The Pacific Northwest contains one of the largest concentrations of aluminum smelting facilities in the world, and in recent years has produced from 40 to 50 percent of the total primary aluminum output of the United States. This heavy concentration of smelting capacity is a direct consequence of the last war. The fortunate circumstance that two huge power plants became available at Bonneville and Grand Coulee on the Columbia River, at a time when national defense needs for aluminum seemed almost limitless, led the defense authorities to follow the lead of the Aluminum Company of America in locating the greater part of the new wartime aluminum plant capacity in that area. Aluminum smelters are heavy users of electric power; cheap power is, indeed, a *sine qua non* of aluminum production, and alternative sources of power were not available elsewhere. The low rate for hydroelectric power charged by the Bonneville authorities (approximately two mills per kilowatt hour) has been the principal factor in sustaining the aluminum smelting industry in the Pacific Northwest. This is in spite of the fact that most of the raw material for the local smelters must make a 2,000-mile journey by rail overland and the great bulk of the output must be shipped an equal or greater distance to reach its markets—a marked competitive disadvantage as compared with plants located closer to raw material and customers.

The chronic power shortage in the Pacific Northwest

The Pacific Northwest probably contains a larger potential of undeveloped hydroelectric energy than any equal area anywhere in the world. In spite of very large additions to its generating capacity during the past decade, the expansion of population and general industrial growth in the area have more than kept pace. At the same time the critical importance of aluminum to the national defense has required the sale of large blocks of Bonneville power to that industry—amounting to approximately 20 percent of the entire electric power output

[1] These producers are Aluminum Company of America (Alcoa), with a smelter at Vancouver, Washington; Kaiser Aluminum and Chemical Corporation, operating smelters at Mead, near Spokane, and Tacoma, Washington; and Reynolds Metals Company, operating smelters at Longview, Washington and Troutdale, near Portland, Oregon.

of the region. Hence a condition of more or less chronic power shortage has developed there, one effect of which has been to necessitate rather severe restrictions on the sale of power to new industries, and even to limit some types of household use. Consequently there has been some tendency to retard the balanced development of the regional economy and considerable opposition has been manifested to further concentration of the aluminum industry in the Pacific Northwest.[1]

This condition of power shortage has been aggravated, of course, by the almost complete failure to expand steam generating capacity in the area during the past 20 years. Well under 10 percent of the entire existing electric utility power capacity in the three Pacific Northwest states consists of steam plant facilities, as compared with about 50 percent in California and a national average for fuel-based plants of close to 75 percent. Long range plans for development of the power potential of the Columbia River and its tributaries will eventually provide some remedy for this unbalanced condition by creating additional upstream reservoirs which will tend to promote more even stream flow, both seasonally and cyclically. Even at best, however, this will be only a partial remedy and it obviously serves no purpose in meeting the present emergency. The crying need of the region is for more stand-by capacity to "firm-up" the fluctuating output of the hydroelectric system.

The rapid growth in recent years of local public utility districts in the Pacific Northwest has further complicated the problem of securing a well balanced expansion of power facilities. These public utility districts are empowered by law to take over and operate the local properties of existing utility systems. This has led to the dismemberment of some important private electric utilities and has discouraged the supply of new investment capital, thus making the integrated development of power facilities more difficult in the area. As a consequence, the whole region has tended to rely increasingly upon the Federal power system, whose plans for new construction depend upon Congressional decision. Hence considerable time lags frequently occur between the original planning and the final fruition of additions to the federally owned power system. When such additions occur, they are likely to be in very large units, but in the meantime there may be long "dry spells" during which the power supplies of the region fall far behind its current needs.

Such a period appears to be approaching its climax at the present moment. For many months signs have not been wanting that the persistent power shortage of the past several years in the Pacific Northwest would be subjected to a crucial test during the current season. The insistent needs of the defense economy during the past year have put increasing pressure on power supplies from every direction, in addition to the necessity of providing for growing civilian requirements. More and more power is demanded by atomic energy plants, by electro-chemical industries producing critical raw material for munitions manufacture, by military installations, by expanding aircraft production, and by a host of other uses. Large drafts were made during the past summer on the water storage and potential power production of the Grand Coulee Dam by pumping large quantities of water into the newly constructed reservoirs and canals of the Columbia Basin irrigation project. At least one aluminum producer in the region (Kaiser Aluminum & Chemical Corporation) was encouraged by the defense authorities to expand smelting capacity during the past year by the installation of an additional pot-line (removed from a war-constructed plant at Riverbank, near Modesto, California), for which additional power was earmarked—if available. Another (Reynolds Metals Company) has announced plans for expanding capacity by reconstructing and enlarging one of its existing pot-lines, which again would require more power to operate.

Plans of the national defense authorities which have been under consideration during the past year called for the location of two additional aluminum smelters in the Northwestern area. The larger of these plants, consisting of three pot-lines designed to produce 85,000 tons of pig aluminum a year, was to be located on the Columbia River, near Wenatchee, in Central Washington, and would be owned and operated by the Aluminum Company of America. It was planned to come into operation during the second half of 1952, and would require approximately 170,000 kilowatts of electric power. The other plant, to be located near Kalispell in Western Montana and to be operated by a newcomer in the industry (Harvey Machine Company), was to produce 54,000 tons of aluminum a year and would require about 110,000 kilowatts of power. This plant was to be based on power from the Hungry Horse Dam, currently under construction by the Bureau of Reclamation on the Flathead River, from which power is expected to be available in 1952-53. Part of the equipment of the Kalispell plant was also to be obtained from the high cost Riverbank plant in California, which has been converted to other uses. In the light of current developments, the early construction of these proposed new plants now seems somewhat doubtful.

Threat to remove part of Northwestern aluminum capacity

Within a week of the Bonneville power cutback another bombshell was dropped on the Northwestern aluminum industry. This was a notification on September 22 from the Office of Defense Mobilization that because of the local power shortage it might be necessary to remove some of the aluminum capacity of that area to other parts of the country. Each of the three producers having smelting plants in the Northwest was asked to supply an estimate of the probable cost and length of time required to remove two or more pot-lines "to the Ohio or other areas where non-interruptible power could be made available economically by purchase or construction." The Defense Mobilizer also raised the question whether a more eco-

[1] Official statements of the Bonneville Power Administration indicate considerable sympathy with this position. See United States Department of the Interior, Bonneville Power Administration, "Advance Program of Transmission System Development, 1950-56," January 1950, pp. 10-13.

nomical solution of the power problem facing the Northwestern aluminum producers could be had by building stand-by power plants.

It is too early to forecast the probable outcome of this radical proposal—whether, in fact, a considerable fraction of the capacity now installed in the Northwest may be removed elsewhere, either temporarily or permanently, or whether the problem of sustaining the maximum possible output of aluminum for national defense can be met by installing steam plants in the Northwest to take up the load which, temporarily at least, the hydro plants are unable to carry.

Numerous factors enter into the problem. Not the least important is the time element. Equally important, but uncertain, are the hazards of weather. The drastic curtailment in the Northwestern power supply may prove to be only temporary, like that in Northern California early in 1948. Heavy rains in the Columbia Basin late in September had, in fact, alleviated the power shortage sufficiently to permit resumption of full aluminum production and postponed the necessity of a general "brownout" of non-essential power use for at least two weeks. How long this relief will last is, of course, unpredictable. It is quite possible that continued heavy rainfall could turn the condition of power shortage into one of plenty. To base national defense planning, so far as aluminum supplies are concerned, upon so uncertain a prospect might, however, be to court disaster. At the opposite extreme it might be a matter of two or three years before normal water conditions are restored in the Columbia River watershed, and in the meantime power supplies would be short for everyone.

To be on the safe side, therefore, some positive action is indicated looking to maximum feasible production of aluminum over a period of years. This requires a weighing of alternatives between measures seeking to maintain or increase output in the Northwest, on the one hand, and on the other, emphasizing larger production elsewhere. The first involves the relative time required to build stand-by facilities in the Northwest (and to some extent the cost of operating such facilities), which would supplement rather than supplant hydro plants as the major source of power supply for aluminum smelting. The second involves the prospect of removing some of the Northwestern pot-lines to other parts of the country where the necessary power facilities can be found or made available with reasonable promptness; or even the construction of entirely new smelters located closer to raw material supplies and equipped with self-contained power plants which would be independent of the vagaries of water supply, even though the unit production cost of aluminum metal might be somewhat higher. It might also prove possible—with a rapid and substantial increase in Columbia River waterflow—to obtain somewhere near capacity production of aluminum in the Northwest, in the interest of national defense, at the expense of a general curtailment or "brownout" for non-essential uses of power.

Needless to say, the proposal to remove some of the Northwestern smelting capacity to other parts of the country aroused a storm of protest, especially in view of the efforts of the defense authorities over the past year to locate additional aluminum plants in the area. It was announced on September 26 that the proposal to remove Northwestern pot-lines would be dropped. It has been suggested in several quarters that the basic purpose back of the Defense Mobilizer's proposal was not primarily to threaten the actual removal of aluminum capacity from the Northwest, but rather to stimulate unified plans for hastening the power development of the region, which has lagged dangerously behind the needs of national defense and local industry.

This whole episode illustrates the crucial importance of a sound balance between fuel-driven plants and hydro plants in planning regional power supplies. At least a minimum of steam capacity is necessary to stabilize the power supply of a region so highly dependent upon water power as the Pacific Northwest. This has also been the experience, for example, of the Tennessee Valley Authority, which currently has a number of very large steam plants under construction in order to firm up the output of its hydro facilities. Largely because of the complex structure of the power set-up in the Northwest, composed of Federal multi-purpose projects, large municipal systems, privately owned utilities, and public utility districts, this vital feature in the whole regional power supply has been neglected, with the unfortunate results we are now witnessing. No one has been willing to undertake the construction of large steam plants—and only large plants would suffice—which would normally be operated only part of the time and which would be relatively costly to operate in a region lacking local supplies of oil, natural gas, or good steam coal. The Bonneville Power Administration has persistently argued the case for stand-by steam capacity in the Northwest as an integral part of the Federal power system, but Congress has so far regarded such proposals with a hostile eye.

Outlook for power supplies and aluminum production in other areas

Whatever the immediate outcome of the proposal to remove some of the Northwestern pot-lines to other areas, which has apparently been dropped for the moment, the suggestion might well be examined on its merits as indicating the possible wisdom of a decentralization and reorientation of the industry. Temporarily, at least, such relocation of existing capacity does not appear to promise much relief from the threatened cut-back in aluminum production for the reason that adequate power supplies are not immediately available elsewhere. Aluminum smelting requires huge quantities of electric energy and very few areas in the United States currently have any substantial surplus of power over their own local requirements; the margin is more likely to narrow than to widen during the next twelve months as the national defense production program is stepped up to its probable

peak. Over the longer term, however, it may well be that, on balance, a considerably larger fraction than at present of the nation's aluminum output could be produced to advantage in areas other than the Pacific Northwest.

Some of the elements entering into this problem have already been suggested. Aside from questions of broad public policy, such as preserving a reasonable balance in the development of the regional economy, the basic industrial comparison is one between more favorable power costs in the Northwest, where the huge Federal multipurpose dams and power projects permit remarkably low rates to large industrial users, and freight cost differentials on raw material inbound and finished product outbound, which are said to "penalize" the Northwestern plants in comparison with competing plants more favorably located in this respect. It may also be pointed out that most of the Northwestern aluminum plants were acquired from the Government by their present owners at very substantial cost discounts. The balancing of these factors probably gives an edge to the newer plants located in the Northwest, all of which have been built within the past decade, though this advantage may be offset to some degree by their greater liability to power curtailment, as compared with recently constructed plants in other areas which produce their own power from fuel sources.

As far back as three years ago the leading American producer (Alcoa) decided that further expansion in the Northwest was less attractive than location in the natural gas area of the Texas Gulf Coast. Construction was begun in 1948 on a 57,000 ton plant based on an entirely new type of spark-fired internal combustion engine using natural gas as fuel and producing direct current, thus obviating the need for a rectifier system to convert alternating current into usable form for the electrolytic smelting process. This lead has been followed by each of the other two large producers in expanding their capacity to meet the needs of national defense requirements; Reynolds is building a plant to utilize natural gas in Texas, and Kaiser is constructing a similar plant near New Orleans.

Another recent technical development which may prove of major importance in the location of aluminum smelters is the discovery of a process which permits the efficient utilization of lignite as a fuel. Lignite or "brown coal" has long been used in Germany and other areas where coal is expensive, but its possibilities appear to have been neglected in this country where better fuels are more abundant. This neglect is due in part to the fact that United States lignite deposits—which are immense in volume as compared with coal—are located almost entirely in areas distant from industrial centers. Lignite itself is not easily transported or stored because of its tendency to spontaneous combustion, and its heating value is low in comparison with most grades of coal. Hence the delivered cost per heat unit derived from lignite compares unfavorably with that of coal at points of utilization or with such an easily transportable fuel as natural gas.

Many industrial raw materials can readily be brought to the fuel supply, however, and it now appears possible through conservation of coal tar by-products to utilize lignite economically at points close to its geologic location for the production of power to be used in aluminum smelting. The Aluminum Company of America has recently begun the construction of an $80 million plant in Southeastern Texas near the site of a large deposit of easily mined lignite which it is planned to use as fuel. The relative economy of lignite in the generation of power as compared with natural gas or hydro power remains to be determined, but it is significant that the leading aluminum

REGULATION X CHANGES

On September 1, the Board of Governors of the Federal Reserve System and the Housing and Home Finance Administrator issued a statement to the press concerning changes in real estate credit controls, including Regulation X of the Board of Governors.

Selected portions of that press statement appear below. Copies of Regulation X, as amended, may be obtained from this bank.

"The Board of Governors of the Federal Reserve System and the Housing and Home Finance Agency today announced the revision of Regulation X and related restrictions on housing credit affecting 1- to 4-family housing to bring the regulation into conformity with the provisions of the new Defense Housing and Community Facilities and Services Act of 1951.

"The act provides that with respect to veterans' home loans guaranteed under the GI bill of rights, where the sales price does not exceed $7,000, the down payment shall not exceed 4%; where the sales price does not exceed $10,000, the down payment shall not exceed 6%; and where the sales price does not exceed $12,000, the down payment shall not exceed 8%.

"With respect to other home loans (conventional and FHA-insured), the act provides that no more than 10% down payment shall be required where the transaction price does not exceed $7,000; no more than 15% where the transaction price does not exceed $10,000; and no more than 20% where the transaction price does not exceed $12,000.

"The act also provides that credit restrictions shall not require the term or maturity of any loan on housing up to $12,000 to be less than 25 years. Under the previous regulations the maximum maturity was 20 years for housing priced at more than $7,000, except for hardship cases under GI loans.

"Similar terms—both as to down payment and maturity—also apply to farm housing loans made by the Farmers Home Administration.

"The new schedule of maximum loans and minimum down payments follows the requirements of the act up to $12,000 and then, as rapidly as practical, returns to the schedule of down payments required under the credit controls instituted last October. Except for fractional changes made in the interest of simplifying calculations, the level of the previous regulations is reached at $15,000 and from that point on the mortgage limits are substantially the same as before.

"The new act also provides for the suspension of credit restrictions in critical defense housing areas for housing programmed for defense workers and military personnel and selling for not more than $12,000 or renting for not more than $85 a month. Regulation X and related restrictions have been amended accordingly, to bring the provisions with respect to defense areas into conformity with the new law. At the same time, it was announced that credit terms are also suspended for defense housing programmed in areas previously designated as critical defense areas.

"Regulation X has been further amended to provide for the exemption from the regulation of certain essential nonresidential defense construction."

producer should have risked a large investment to put it to the test.

These developments of the past few years in the utilization of cheap fuels, first natural gas and now lignite, promise to free the aluminum smelting industry from its earlier dependence on hydroelectric power which has hitherto tied it to locations offering almost no other advantages, or has even handicapped it with transportation disadvantages. The present trend in the location of new aluminum smelters may well prove permanent and lead to a wider dispersal of the industry and to greater continuity in its operations.

If the earlier trend to additional concentration of aluminum smelting capacity in the Pacific Northwest is reversed and the resulting burden on the fluctuating power supplies of the area is relieved, the consequent easing of the situation would be of material benefit to the whole regional economy. The periodic power shortages would tend to become less acute and the available power supply in normal times would be relatively more abundant. This would permit the more rapid development of diversified industries offering greater employment opportunities as well as the enjoyment by household users of less restricted use of electric power. The industrialization of the region, which received a tremendous impetus during the war, has been greatly hampered since that time by the basic lack of power available to all comers and many industries seeking to locate in the area have had to be turned away. This is a paradoxical situation for a region having such enormous latent power resources and the lowest rates for industrial power in the nation. A broader base for economic development would probably mean far more to the regional economy in the long run than continued mortgaging of a disproportionate share of its power resources to a single industry.[1]

[1] For a more detailed discussion of the power and fuel situation in the Pacific Northwest, the reader is referred to the Supplement to the MONTHLY REVIEW for November, 1950, "Western Power and Fuel Outlook." See especially pages 1-9, 22, 37, 40-41, 47.

DEFENSE ACTIVITY, EMPLOYMENT, AND THE STRUCTURE OF TWELFTH DISTRICT INDUSTRY

A SHARP increase in total employment has been one of the outstanding features of the impact of the Korean war on the Twelfth District economy, as well as in the nation. Though District employment increased in most lines of activity from June 1950 to June 1951, manufacturing and government employment gained the most. Yet despite the greater emphasis on the production of military and civilian goods to meet the expanding level of demand, the distribution of workers among broad segments of nonagricultural employment has remained fairly stable. Employment data reveal interesting characteristics of the District economy. They point up the existence of a substantial industrial base, as well as large Government facilities. They also show that much greater changes than any we have had since the Korean outbreak would be necessary to cause any major alteration in the structure of the economy.

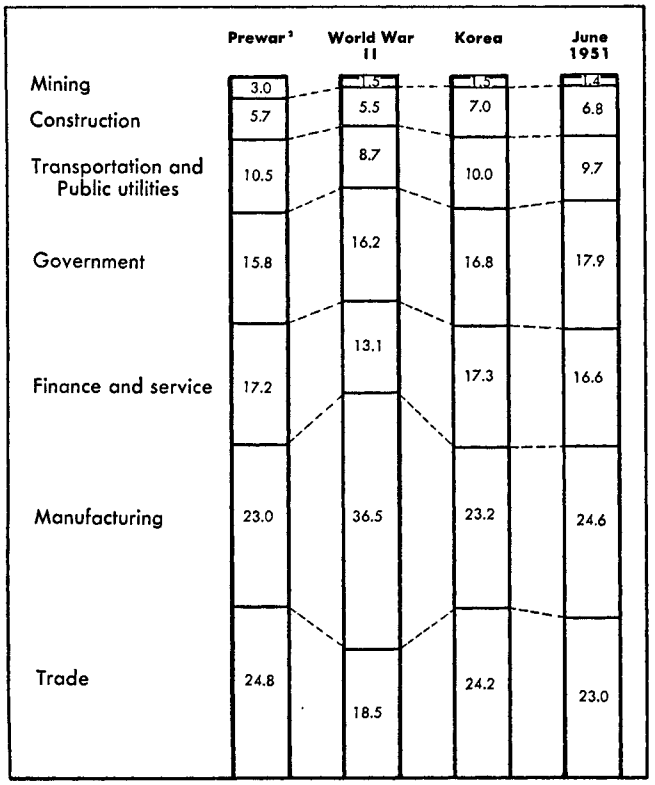
Employment in District expands more than in the nation

Nonagricultural employment in this District increased more rapidly in the twelve months following Korea than in the nation as a whole. Manufacturing employment and government employment, both reflecting the increased program of military preparedness, expanded more than half again as much as comparable activity in the country as a whole. The very sharp rise in government employment is due to the existence in the District of a large number of major military installations and a highly developed naval shore establishment. The availability of aircraft facilities and a rapidly expanding, well diversified machinery industry has accounted for the sharper increase in manufacturing employment here than in the nation.

Though similar in some respects to developments during World War II, the present expansion in manufacturing employment is based to a considerably greater degree on facilities and skills already in existence in this District than was true in the early 1940's. At that time, the creation of aircraft and shipbuilding facilities and the development of supporting industries resulted in an unusually large volume of defense plant construction. Currently, however, defense plant construction, while large in volume, is relatively moderate compared to either total construction activity or the volume of defense contracts let in this District. The existing industrial base, which resulted from the growth during World War II and the large postwar expansion, offers considerable opportunity to the Government for procurement of a wide variety of military goods in this District. Roughly half of the District's defense contracts have been for air frame production, and a very substantial proportion of the electronics and radio gear for these air frames has also been subcontracted for here. In addition, a large volume of contracts has been let to District firms for both nonelectrical and electrical equipment, including some types of machine tools. Many District machine shops, and even some toy manufacturers, have obtained contracts for small parts and specialized equipment. The District food and lumber industries, and even the District clothing industry, have felt the impact of increased Government buying.

It is significant to note, however, that the shipbuilding industry, which expanded so rapidly during World War II, has shown relatively little activity, except for one contract signed recently by a San Francisco Bay Area firm. Although shipbuilding has been but moderately active on a national basis, the Twelfth District's share has nevertheless been disappointing. This industry on the Pacific Coast continues to suffer from the handicaps of cost differentials and the relatively greater availability of large-scale facilities in other parts of the country.

PERCENTAGE DISTRIBUTION OF NONAGRICULTURAL EMPLOYMENT BY MAJOR INDUSTRY GROUPS—TWELFTH DISTRICT, SELECTED DATES, 1939-51[1]



[1] Prewar data are for October 1939, World War II for June 1943, and Korea for June 1950.
[2] Includes data for five states only—Arizona, California, Nevada, Utah, and Washington—comprising more than 65 percent of total nonagricultural employment in the District.

Structure of nonagricultural employment remains relatively stable

One of the interesting developments in the structure of nonagricultural employment in the past year has been the rather moderate shift in its distribution despite the rather large gains in manufacturing and government employment. In the accompanying chart, the shifts that occurred during the early 1940's and since Korea are illustrated. It is apparent that manufacturing employment and government employment have become somewhat more important than they were a year ago, but the change evident in manufacturing employment is much more moderate than during World War II.

Several factors have contributed to the stability of the pattern of nonagricultural employment. First of all, the intensity of the military preparedness program is not so great as in World War II. It has not been necessary, therefore, to restrict or discourage employment in many nonmanufacturing lines, particularly in trade and services. The labor supply in this District and in the nation has been adequate, except for some critical skills, to meet the expansion required by the defense program thus far. In World War II, however, despite a large increase in the total labor force, conditions were such that many nonmanufacturing activities were unable to recruit employees, while the number of workers in manufacturing expanded very rapidly.

At the present time the District labor force is more fully employed than it was in the early 1940's. In addition, total employment is much higher now than ten years ago. An expansion, or an increase in the proportion of total employment accounted for by manufacturing, as great as that which occurred in World War II would require an increase of manufacturing employment of 50 percent over June 1951 levels. To achieve a 50 percent increase in manufacturing would require a very large labor force increase and substantial shifts within the structure of employment. A major source of labor force increase during the 1940's was in-migration; but with employment throughout the nation at a high level, this is not very likely at present. In the absence of rapid in-migration, it would be necessary to increase the number of students and housewives in the labor force, and bring about a major cut in trade and service employment. Should greater emphasis be placed on military production in the near future and the demands upon the manufacturing facilities of this District be increased sharply, such a movement might develop.

District employment pattern similar to that of pre-World War II

Also of interest is the fact that, even with the large increase in manufacturing facilities that has occurred in the past ten years, manufacturing employment currently accounts for roughly the same proportion of nonagricultural employment as it did before World War II, and the proportion continues to be substantially below that for the United States. In a good many discussions of the District economy this feature has been pointed out, and it has been assumed, therefore, that industry in the District is underdeveloped. There is no question but that there are large areas within the District that have little or no industry, but these areas are frequently high-yielding agricultural regions or are sparsely populated. What seems to contribute most to the relatively low ratio of manufacturing employment in the District is the unusually high level of government employment and trade and service employment, and also to some extent the large number of workers in construction.

The high level of government employment, representing principally military establishments of large size, is partly the result of the geographical relationship of this District to many parts of the world, particularly the Orient. Another factor is the long coastline and the deep-water ports available for naval shipyards and repair facilities and for outlets of military shipments. In addition, the large land areas in the District, some of them widely isolated from centers of population, offer excellent opportunity for the location of air bases, munitions plants, and atomic energy installations.

The high level of employment in trade and services reflects the existence of highly desirable resort and recreation areas and high incomes in this District. Historically,

the ratio of employment in trade and the services to population has been higher in this District than in the nation as a whole. Except for the war years, District trade and service employment has grown almost as rapidly as other types of employment.

A greater percentage of total nonfarm employment is engaged in construction activity in the District than in the nation as a whole. The much greater population increase in the District over the past decade has resulted in more intense activity in construction, particularly in the residential and public fields, than in the nation. At present, however, total construction activity is tapering off. Both residential and commercial construction are dropping sharply as a result, in part at least, of various Governmental controls and regulations and the decline is only partially offset by the rising volume of industrial and public construction.

Composition of manufacturing employment changes

These factors, however, act to conceal the fundamental change in the structure of manufacturing and its importance in the Twelfth District. The heavier industries, such as iron and steel, aluminum, aircraft, and machinery, have grown much more rapidly in the past ten years or so than the lighter industries, and today account for a considerably higher proportion of total manufacturing employment than before. These industries, it should be noted, require a much heavier investment in plant and equipment per unit of output, and, what is even more important in the present context, they require a greater amount of capital per employee. It is in this sense that the District may be termed more industrialized than formerly, in spite of the relative stability of manufacturing employment as a percentage of total nonagricultural employment.

In California, particularly, is this true. Industries such as aircraft, machinery (including electrical), and a very wide range of primary and fabricated metal product industries have increased greatly in size and in relation to other manufacturing. Food processing, until recently the most important single industry in the state in terms of the number of workers employed, has declined over the past decade in its percentage share of manufacturing employment, as indeed have nondurable goods industries in general.

The general pattern of development is similar in Washington, where much the same industries account for the principal changes in the structure of employment in the state. Significantly larger shares of total nonfarm employment are accounted for today by aircraft, metal products—particularly in the aluminum industry in which there has been a substantial increase in capacity—, machinery (including electrical), and fabricated metal products. Lumber and food processing, which historically have been the dominant manufacturing industries in Washington, have declined in relative importance in the past ten years. In 1940, lumber and food processing accounted for more than 70 percent of all manufacturing employment in the state; today they account for a little less than half.

Even though this pattern of industrial expansion and diversification may continue in California, Washington, and other District states, there is some likelihood that manufacturing will not account for so high a proportion of nonagricultural income and employment in the Twelfth District as in the nation. Employment in trade and services and in the construction industry will probably tend to keep pace with manufacturing. Even allowing for a reduction in military activity, government employment may remain relatively high in this District. As a consequence, when production of military goods is small, manufacturing employment may not grow much more rapidly than total nonagricultural employment.

EARNINGS AND EXPENSES OF TWELFTH DISTRICT MEMBER BANKS, FIRST HALF 1951

Net current earnings of Twelfth District member banks during the first half of 1951 were almost 10 percent higher than during the corresponding period of last year, but sharply increased income taxes resulted in a 5 percent drop in net profits. The 13 percent year-to-year gain in gross earnings reflected the shifting pattern of bank assets since the spring of 1950 as banks reduced their Government security portfolios in order to extend credit to business and other private borrowers. Both earnings and profits of District member banks closely paralleled the national trend.

Loan expansion was the prime mover in the general advance in earnings of Twelfth District member banks. Interest and discount on loans amounted to 21 percent more than in the year-ago period, according to the preliminary tabulation. The average volume of loans outstanding rose somewhat more rapidly than did earnings on loans. The over-all rate of return on loans was fractionally lower than in the first half of 1950, despite the rising trend of interest rates. This reflects the fact that business and real estate loans increased more rapidly than consumer loans which have a higher yield. All the 15 largest banks registered increases in loan income, ranging from 15 to 69 percent, with the most spectacular gains occurring in banks whose asset position allowed abundant room for loan expansion. For the nation as a whole, member bank loan earnings were up 26 percent.

As District member banks extended new loans, they drew down their Government security holdings, which averaged 16 percent less during the first half of 1951 than in the corresponding 1950 period. Interest earnings on Governments were off only 11 percent, however, reflecting the higher yields in 1951; the average rate of return on Government securities held by Twelfth District banks during the January-June period was 1.64 percent per annum compared with 1.55 percent a year previously.

SELECTED EARNINGS AND EXPENSE ITEMS OF MEMBER BANKS—TWELFTH DISTRICT AND UNITED STATES, JANUARY-JUNE, 1950 AND 1951

	Twelfth District					U. S.
	All banks		Percent change			
	1st half 1951p	1st half 1950	All	15 largest	Other	percent change—all banks
	(in millions)					
Interest and discount on loans[1]	177.6	146.7	+21.1	+21.6	+19.1	+26.2
Interest on Government securities	48.0	53.9	—10.9	—11.9	— 7.2	— 6.7
Other earnings	62.5	54.4	+14.9	+14.2	+17.9	+12.2
Total earnings	288.1	254.9	+13.0	+13.1	+12.7	+13.7
Total expenses	183.7	159.7	+15.0	+15.1	+14.7	+11.3
Net current earnings	104.4	95.3	+ 9.6	+ 9.8	+ 9.0	+17.4
Total recoveries and profits	8.5	10.1	...	...	...	...
Total losses and charge-offs	13.1	14.5	...	...	...	...
Net losses and charge-offs	4.7	4.4	...	...	...	...
Profits before income taxes	99.8	90.9	+ 9.8	+ 8.3	+16.8	+12.0
Taxes on net income	39.1	26.9	+45.0	+42.8	+53.6	+49.7
Net profits after taxes	60.7	63.9	— 5.0	— 5.6	— 2.1	— 4.0
Cash dividends declared[2]	31.6	24.6	+28.5	+27.1	+39.6	+ 9.7
Undistributed profits	29.1	39.3	—26.0	—28.3	—16.9	—12.8

[1] United States loan earnings figures include service charges and other fees on loans, while Twelfth District figures include interest and discount only. Service charges and fees on loans in Twelfth District included in "other earnings."
[2] Figures include common-stock dividends only.
p—preliminary.
Note: Totals and percent changes are based on unrounded figures.

Interest earnings on Government securities of all member banks in the United States were 7 percent less than in the first half of 1950.

The drop in Government security earnings, as well as the increase in loan income, was somewhat greater for the 15 largest banks than for the rest of the member banks in the District considered as a group. Among the 15 largest, income from Governments was down 2 to 20 percent from the first six months of last year. Other earnings of Twelfth District member banks were 15 percent higher than in the first half of 1950.

Total earnings were up 13 percent, with little variation between the 15 largest banks as a group and the smaller banks. Total expenses were 15 percent higher. Although a breakdown of the expense items is not yet available, it is probable that the major factors responsible for the increase were larger salaries and generally higher rates of interest paid on time and savings deposits.

Net current earnings were almost 10 percent above the corresponding 1950 total, representing a return of 19.5 percent (annual rate) on capital accounts. Of the 15 largest banks, two recorded fractional declines while the others' net current earnings increased by varying amounts up to 50 percent. For the United States as a whole, member bank net current earnings were more than 17 percent above 1950 levels, reflecting greater expansion of loan income, less reduction in earnings on Government securities, and smaller expense increases than in the District.

Despite the favorable earnings picture, net profits after taxes were less than in the first half of 1950. Income taxes increased substantially as a result of higher tax rates and larger earnings. In the Twelfth District, the amount absorbed by income taxes was 45 percent larger than in the corresponding period of last year, drawing off almost two-fifths of net income. Net profits after taxes were 5 percent below the 1950 first-half figure and equalled 11 percent (annual rate) on capital accounts in contrast to last year's 13 percent. Nationally, net profits were off 4 percent. Net profits of the 15 largest banks in the District, down 5 percent, showed wide variation in the year-to-year comparison: up for eight banks, down for seven. For the smaller banks as a group, net profits were down only 2 percent.

While net profits declined, Twelfth District member banks nevertheless raised the total amount of their dividends. Cash dividends declared on common stock were 28 percent higher than in the first half of 1950. More than half the net profits was paid out as cash dividends. The 15 largest banks as a group increased cash dividends 27 percent, as seven of them declared dividends 20 to 60 percent higher than last year, while the other eight made no change in dividend policy.

INCOME IN THE TWELFTH DISTRICT, 1950[1]

INCOME payments to individuals in all seven states of the Twelfth District were considerably larger in 1950 than in 1949. It would have been more newsworthy, however, if they had declined in some of the states, since income payments increased in every state in the United States from 1949 to 1950. What is more, they increased at roughly the same rate in most sections of the nation. The District increase was the same as the national—11 percent—and the deviations above and below that mark in other major areas of the country did not exceed 3 percentage points. The increases were even more uniform among the Twelfth District states, ranging from a 9 percent increase in Idaho and Utah to a 13 percent increase in Arizona and Nevada. California retained its position as second highest state in terms of total income, but dropped from sixth to seventh place in per capita income. Nevada remained the third highest per capita income state.

Agricultural income varies the most

The varied types of economic structure brought about by the diverse climates and terrains usually result in a variety of ups and downs in economic activity throughout the United States from year to year. In 1950, however, activity increased in most lines, reflecting both the general pick-up in business in the first half of the year and the Korean war in the second half.

Agricultural income varied more throughout the country than other components of income, changes ranging

[1] The present discussion is based on the estimates which appeared in the Department of Commerce *Survey of Current Business*, August 1951, pp. 11-21.

PER CAPITA INCOME PAYMENTS—TWELFTH DISTRICT, 1940-50

	1940	1944	1948	1949	1950
Arizona	$ 466	$ 959	$1,169	$1,138	$1,240
California	803	1,535	1,618	1,594	1,751
Idaho	443	1,029	1,307	1,220	1,287
Nevada	821	1,383	1,686	1,667	1,875
Oregon	575	1,302	1,451	1,385	1,523
Utah	478	1,061	1,216	1,196	1,271
Washington	632	1,495	1,523	1,470	1,642
Twelfth District	709	1,443	1,544	1,508	1,656
United States	575	1,160	1,383	1,320	1,436

Percent change	1929-50	1940-50	1944-50	1948-50	1949-50
Arizona	+116	+166	+ 29	+ 6	+ 9
California	+ 85	+118	+ 14	+ 8	+ 10
Idaho	+148	+191	+ 25	— 2	+ 5
Nevada	+129	+128	+ 36	+ 11	+ 12
Oregon	+138	+165	+ 17	+ 5	+ 10
Utah	+137	+166	+ 20	+ 5	+ 6
Washington	+130	+160	+ 10	+ 8	+ 12
Twelfth District	+103	+134	+ 15	+ 7	+ 10
United States	+111	+150	+ 24	+ 4	+ 9

Note: The above figures supersede those that have been published in previous years. Revisions have been made by the Department of Commerce to incorporate the more complete income data that have been made available by the states and adjustments of population estimates to the 1950 census.

from —28 percent in Oklahoma to +64 percent in Montana. In the Twelfth District, it ranged from a small decline in Utah, where agricultural income accounts for about 10 percent of total income, to a 28 percent increase in Washington, where it accounts for 8 percent of total income. Large increases in the value of cotton production contributed to higher levels of farm income in Arizona and California.

Government income payments[1] increased 14 percent in both the District and the nation, owing almost entirely to the disbursement of Government life insurance dividends and to an increase in cash pay of military personnel stationed in the country. Government income payments make up a greater portion of total income in the Twelfth District than in the nation as a whole. A state bonus to veterans of World War II accounted for part of the 22 percent rise in government income payments in Washington. Nevada's 30 percent rise in government income payments was the greatest in the nation.

When government and agricultural income payments are subtracted from the total, the residual private nonfarm income is even more uniform in its changes than total income. Private nonfarm income increased slightly less in the District than in the nation—10 percent as compared to 11 percent. Trade and service income, more important in the District total than in the national, increased somewhat less here, while manufacturing payrolls, less important here, increased somewhat more. The smaller increase in trade and service income in the District, according to the Department of Commerce, is partly a reflection of the stability of income from motion-picture production in California.

Changes more pronounced in per capita income

Though per capita income provides no clue to changes in the distribution of income, since it is merely total income divided by total population, it is nevertheless useful

[1] Government income payments are the total of wages and salaries, interest, social insurance benefits, and other types of income disbursements to individuals by Federal, state, and local agencies.

TOTAL INCOME PAYMENTS TO INDIVIDUALS—TWELFTH DISTRICT, 1940-50

(amounts in millions)

	1940	1944	1948	1949	1950
Arizona	$ 237	$ 591	$ 832	$ 826	$ 935
California	5,606	13,739	16,937	16,731	18,542
Idaho	232	537	723	698	763
Nevada	92	213	268	265	300
Oregon	633	1,672	2,150	2,068	2,322
Utah	265	644	806	810	883
Washington	1,100	3,240	3,543	3,489	3,912
Twelfth District	8,165	20,636	25,259	24,887	27,657
United States	75,852	153,306	202,007	196,128	217,245

Percent change	1929-50	1940-50	1944-50	1948-50	1949-50
Arizona	+282	+295	+ 58	+ 12	+ 13
California	+255	+231	+ 35	+ 9	+ 11
Idaho	+232	+229	+ 42	+ 6	+ 9
Nevada	+305	+226	+ 41	+ 12	+ 13
Oregon	+285	+267	+ 39	+ 8	+ 12
Utah	+225	+233	+ 37	+ 10	+ 9
Washington	+254	+256	+ 21	+ 10	+ 12
Twelfth District	+257	+239	+ 34	+ 9	+ 11
United States	+163	+186	+ 42	+ 8	+ 11

Note: The above figures supersede those that have been published in previous years. Revisions have been made by the Department of Commerce to incorporate the more complete income data that have been made available by the states.

in determining the significance of changes in total income in any one area. If total income rises 10 percent in a country from one period to another, but population rises 15 percent, the people of the country might be worse off despite the rise in total income, since the number of people that ate the pie grew more than the pie itself. From 1949 to 1950, changes in per capita income varied more widely among individual states of the nation than did changes in total income. Changes varied from —1 percent to +15 percent in the nation, but only from +5 percent +12 percent among the Twelfth District states. Per capita income increased slightly more in the District as a whole than in the nation. Losses that had been sustained from 1948 to 1949 were made up by all District states except Idaho.

Changes since 1940

Per capita income in the District has been unable to keep up with the rate of gain in total income since 1940, because population has increased so much. Though total income more than trebled during the ten years, per capita income only doubled. Total income increased more than per capita income in all District states, and, in fact, in all but four states in the nation. The difference in the rate of increase between total and per capita income was greater in the District, however, than in other areas.

Increases in total income since 1940 in Twelfth District states were among the highest in the nation. Arizona's gain, in fact, was second highest. District per capita income, on the other hand, though still well above the national average, was not so much above it in 1950 as it was in 1940. The other two areas in the nation with the highest per capita income in 1940—the New England and the Middle Eastern states—were also less above the national average in 1950 than in 1940, pointing out the trend toward greater equality in per capita income throughout the nation.

BUSINESS INDEXES—TWELFTH DISTRICT[1]

(1935-39 average = 100)

Year and month	Industrial production (physical volume)[2]								Total mf'g employment[4]	Carloadings (number)[2]	Dep't store sales (value)[2]	Retail food prices[3,5]	Waterborne foreign trade[3,6]	
	Lumber	Petroleum[3] Crude	Petroleum[3] Refined	Cement	Lead[3]	Copper[3]	Wheat flour[3]	Electric power					Exports	Imports
1929	148	129	127	110	171	160	106	83	....	135	112	132.0	124	118
1931	77	83	90	74	104	75	101	82	....	91	92	104.0	90	76
1933	62	76	81	54	75	26	88	73	....	70	66	86.8	72	69
1934	67	77	81	70	79	36	95	79	....	81	74	93.2	86	74
1935	83	92	91	68	89	57	94	85	88	88	86	99.6	88	103
1936	106	94	98	117	100	98	96	96	100	103	99	100.3	86	110
1937	113	105	105	112	118	135	99	105	112	109	106	104.5	112	114
1938	88	110	103	92	96	88	96	102	96	96	101	99.0	108	82
1939	110	99	103	114	97	122	107	112	104	104	109	96.9	107	90
1940	120	98	103	124	112	144	103	122	118	110	119	97.6	86	96
1941	142	102	110	164	113	163	103	136	155	128	139	107.9	...	...
1942	141	110	116	194	118	188	104	167	230	137	171	130.9	...	...
1943	137	125	135	160	104	192	115	214	306	133	203	143.4	...	...
1944	136	137	151	128	93	171	119	231	295	141	223	142.1	...	...
1945	109	144	160	131	81	137	132	219	229	134	247	146.3	...	...
1946	130	139	148	165	73	109	128	219	181	136	305	167.4	58	55
1947	147	147	159	193	98	163	133	256	187	142	330	200.3	85	78
1948	159	149	162	211	109	154	116	284	191	134	353	216.1	57	93
1949	151	147	167	202	105	142	104	303	183	126	331	209.6	55	115
1950	171	144	168	227	113	176	94	333	197	131	353	209.8	59	131r
1950														
June	181	142	170	244	118	172	105	331	196	148	343	205.9	66	150
July	184	142	170	245	87	172r	113	341	199	125	454	209.4	59	110
August	186	145	178	251	96	177	112	340	207	135	374	212.5	48	141
September	176	148	177	248	104	175	105	339	208	140	368	211.0	58	134
October	187	153	177	252	106	176	99	352	211	131	343	214.1	62	148
November	167	154	179	229	111	195	97	353	209	131	345	216.0	68	167
December	168	154	173	229	118	195	120	345	209	152	376	222.9	70	167
1951														
January	187	154	176	239	101	181	134	361	212	130	420	230.8	75	146
February	171	155	187	255	110	178	121	361	218	124	375	230.2	98	159
March	168	155	179	246	106	180	111	380	219	133	335	234.5	110	169
April	189	155	180	247	101	195	110	378	221	152	346	233.0	122	174
May	199	155	179	278	101	182	106	378	224	142	348	235.3	126	134
June	190	157	179	266	98r	175r	96r	378	226	144	347	223.5	...	161
July	154	156	182	330	91	170	98	393	224	123	364	234.6	...	...

BANKING AND CREDIT STATISTICS—TWELFTH DISTRICT

(amounts in millions of dollars)

Year and month	Condition items of all member banks[7] Loans and discounts	U.S. Gov't securities	Demand deposits adjusted[8]	Total time deposits	Bank rates on short-term business loans[9]	Member bank reserves and related items[10] Reserve bank credit[11]	Commercial operations[12]	Treasury operations[12]	Coin and currency in circulation[11]	Reserves	Bank debits index 31 cities[3,13] (1935-39 = 100)[2]
1929	2,239	495	1,234	1,790	.....	− 34	0	+ 23	− 6	175	146
1931	1,898	547	984	1,727	.....	+ 21	− 154	+ 154	+ 48	147	97
1933	1,486	720	951	1,609	.....	− 2	− 110	+ 150	− 18	185	63
1934	1,469	1,064	1,201	1,875	.....	− 7	− 198	+ 257	+ 4	242	72
1935	1,537	1,275	1,389	2,064	.....	+ 2	− 163	+ 219	+ 14	287	87
1936	1,682	1,334	1,791	2,101	.....	+ 6	− 227	+ 454	+ 38	479	102
1937	1,871	1,270	1,740	2,187	.....	− 1	− 90	+ 157	− 3	549	111
1938	1,869	1,323	1,781	2,221	.....	− 3	− 240	+ 276	+ 20	565	98
1939	1,967	1,450	1,983	2,267	.....	+ 2	− 192	+ 245	+ 31	584	102
1940	2,130	1,482	2,390	2,360	.....	+ 2	− 148	+ 420	+ 96	754	110
1941	2,451	1,738	2,893	2,425	.....	+ 4	− 596	+1,000	+ 227	930	134
1942	2,170	3,630	4,356	2,609	.....	+ 107	−1,980	+2,826	+ 643	1,232	165
1943	2,106	6,235	5,998	3,226	.....	+ 214	−3,751	+4,486	+ 708	1,462	211
1944	2,254	8,263	6,950	4,144	.....	+ 98	−3,534	+4,483	+ 789	1,706	237
1945	2,663	10,450	8,203	5,211	.....	− 76	−3,743	+4,682	+ 545	2,033	260
1946	4,068	8,426	8,821	5,797	.....	+ 9	−1,607	+1,329	− 326	2,094	298
1947	5,358	7,247	8,922	6,006	.....	− 302	− 510	+ 698	− 206	2,202	326
1948	6,032	6,366	8,655	6,087	.....	+ 17	+ 472	− 482	− 209	2,420	355
1949	5,925	7,016	8,536	6,255	3.20	+ 13	− 930	+ 378	− 65	1,924	350
1950	7,093	6,381	9,254	6,251	3.35	+ 39	−1,141	+1,198	− 14	2,026	395
1950											
July	6,162	6,810	8,458	6,250	.....	+ 3	− 149	+ 169	0	1,858	382
August	6,418	6,699	8,627	6,210	.....	− 2	− 102	+ 125	+ 18	1,863	421
September	6,664	6,495	8,754	6,213	3.29	+ 62	− 45	+ 72	+ 9	1,893	417
October	6,810	6,452	8,871	6,239	.....	− 56	− 93	+ 150	+ 10	1,930	428
November	6,963	6,319	9,018	6,194	.....	+ 24	− 21	+ 42	− 3	1,983	425
December	7,093	6,381	9,254	6,251	3.37	+ 48	− 80	+ 131	+ 4	2,026	464
1951											
January	7,152	6,071	9,190	6,337	.....	+ 30	− 59	+ 168	− 68	2,284	455
February	7,184	5,811	8,834	6,352	.....	− 32	− 38	+ 6	+ 21	2,206	444
March	7,293	5,734	8,819	6,338	3.48	− 3	− 124	+ 130	− 8	2,186	461
April	7,367	5,696	8,828	6,332	.....	− 45	− 200	+ 226	+ 26	2,180	431
May	7,422	5,685	8,834	6,357	.....	+ 13	− 162	+ 150	+ 36	2,149	449
June	7,509	5,708	8,862	6,448	3.67	+ 73	− 113	+ 199	+ 39	2,217	461
July	7,473	6,005	9,052	6,510	.....	− 14	− 342	+ 298	+ 19	2,186	429r
August	7,630	6,000	9,058	6,547	.....	+ 159	− 80	+ 86	+ 41	2,312	443

[1] Adjusted for seasonal variation, except where indicated. Except for department store statistics, all indexes are based upon data from outside sources, as follows: lumber, various lumber trade associations; petroleum, cement, copper, and lead, U.S. Bureau of Mines; wheat flour, U.S. Bureau of the Census; electric power, Federal Power Commission; manufacturing employment, U.S. Bureau of Labor Statistics and cooperating state agencies; retail food prices, U.S. Bureau of Labor Statistics; carloadings, various railroads and railroad associations; and foreign trade, U.S. Bureau of the Census. [2] Daily average. [3] Not adjusted for seasonal variation. [4] Excludes fish, fruit, and vegetable canning. [5] Los Angeles, San Francisco, and Seattle indexes combined. [6] Commercial cargo only, in physical volume, for Los Angeles, San Francisco, San Diego, Oregon, and Washington customs districts; starting with July 1950, "special category" exports are excluded because of security reasons. [7] Annual figures are as of end of year, monthly figures as of last Wednesday in month or, where applicable, as of call report date. [8] Demand deposits, excluding interbank and U.S. Gov't deposits, less cash items in process of collection. Monthly data partly estimated. [9] Average rates on loans made in five major cities during the first 15 days of the month. [10] End of year and end of month figures. [11] Changes from end of previous month or year. [12] Minus sign indicates flow of funds out of the District in the case of commercial operations, and excess of receipts over disbursements in the case of Treasury operations. [13] Debits to total deposit accounts, excluding interbank deposits. *r*—revised.